LARGE DISCS WITH LARGE CUPS – A DIAGNOSTIC CHALLENGE IN AFRICAN PATIENTS

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Master of Medicine in Ophthalmology.

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DECLARATION

I, Darshana Soma, hereby declare that this research report is my own work. It is being submitted for the degree of Master of Medicine (Ophthalmology) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Signed _____

On this _____ day of _____ 2009

The work reported in this research report was carried out at the Department of Ophthalmology, St John Eye Hospital (Chris Hani Baragwanath Hospital), Johannesburg, South Africa.

DEDICATION

This research report is dedicated to my parents and my siblings in recognition of their continual support and encouragement throughout my life.

ETHICS APPROVAL

The project was approved by the Human Research Ethics Committee (Medical) at the University of the Witwatersrand.

Clearance certificate number: M070435

PRESENTATIONS ARISING FROM THIS STUDY

The results of this study were presented at the annual congress of the Ophthalmological Society of South Africa (OSSA) in March 2008.

Title: Large optic discs with large cups – a diagnostic challenge in African patients

Presenter: Darshana Soma

ABSTRACT

Objectives

To determine in a cohort of 69 African patients with large optic discs and large optic cups, that proportion of patients with physiologic cupping (normal eyes) misdiagnosed as glaucomatous. To evaluate the possible relationship between optic disc size and central corneal thickness.

Design and method

A case series of 69 patients with large discs (vertical disc height measuring ≥1.8mm) and large cups (vertical cup to disc ratio ≥0.6) was evaluated to determine what proportion had glaucoma and what proportion was normal. Patients categorized as normal were further evaluated to determine what proportion were previously misdiagnosed and treated for glaucoma. Patients with a suspected diagnosis of glaucoma, normal tension glaucoma or primary open angle glaucoma were recruited from the glaucoma clinic at St John Eye Hospital.

Outcome measures included corrected vertical disc height (VDH), vertical cup to disc ratio (CDR), central corneal thickness (CCT), the relationship between VDH and vertical cup height, the relationship between VDH and CCT, adjusted intraocular pressure (A-IOP), retinal nerve fiber layer analysis and visual fields.

Results

Sixty-nine African patients (138 eyes) with large discs and large cups were evaluated. 41 (59%) were females and 28 (41%) were males. The mean age was 56 years. Of the 69 patients, 51 (74%) had physiologic cupping (normal eyes) and 18 (26%) patients were glaucomatous. Of the group of 51 patients with physiologic cupping, there were 9 patients who were previously misdiagnosed with glaucoma and who had received treatment.

VDH ranged between 1.9 and 3.2mm (mean ±SD, 2.3±0.26mm). The distribution analysis of VDH measurements noted the largest cluster around 2.3mm. CCT ranged between 454μm and 618μm (mean±SD, 516±37μm). 107 (77.5%) of the 138 eyes had CCT < 544μm.

Conclusion

Large cup to disc ratio in relation to large disc size can be normal. It can be misdiagnosed as glaucomatous if objective retinal nerve fiber layer analysis is not carried out. In this study, 9 (18%) patients from a group of 51 patients with physiologic cupping were misdiagnosed as glaucomatous. There was no linear correlation between CCT and VDH in this study. Pearson's correlation coefficient was 0.13. The majority (77.5%) of eyes had thin corneas (CCT < 544μm).

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NOMENCLATURE

1.	A-IOP	adjusted intraocular pressure
2.	CCT	central corneal thickness
3.	CDR	vertical cup to disc ratio
4.	D	diopter
5.	eg.	example
6.	GDxVCC	nerve fiber analyzer GDx with variable corneal compensation
7.	HDD	horizontal disc diameter
8.	ie.	that is
9.	IOP	intraocular pressure
10.	mm	millimeters
11.	mmHg	millimeters of mercury
12.	µm	micrometers
13.	NFI	nerve fiber index
14.	nm	nanometers
15.	OSSA	Ophthalmological Society of South Africa
16.	RNFL	retinal nerve fiber layer
17.	SD	standard deviation
18.	TSNIT	temporal, superior, nasal, inferior, temporal
19.	VDH	corrected vertical disc height